

Preliminary report of lake sediment investigation in Lützow-Holm Bay, East Antarctica by JARE58/59

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It is well known that the area of the continental ice sheet covering Antarctica retreated greatly since the last glacial maximum (LGM). At present, about 0.2% of Antarctica is ice-free area (Burtib-Johnson et al., 2016). There are also several ice free areas along the Sôya Coast, Lützow-Holm Bay in East Antarctica, and over 100 lakes are scattered in these areas. The relative sea-level (RSL) change as a result of the crustal uplift in this region was discussed for the late Holocene based on the several lakes sediment analysis (e.g., Takano et al., 2012, Verleyen et al., 2017). However, there has been no study that tried to make clear about RSL curve in the early Holocene, although it is essential to know how the ice-sheet retreat with RSL change during the entire Holocene. This is depended on the technical problem. It was difficult to obtain the hard and sticky glacial silt and sandy gravel layers by portable core sampler. Then, the lake sediments, which were deposited under early development of lake formation, had been not analyzed.

Between November 2017 and January 2018, the investigations of lake and shallow marine sediments were carried out by lake observation team as part of the 58/59th Japanese Antarctic Research Expedition (JARE). A new portable percussion piston corer was installed into this investigation for obtaining the sediment reached down to the basement rock including glacial silt and sandy gravel layers. A total of 26 sediment cores from 23 lakes and shallow marines were obtained. These 23 areas can roughly separated for four types based on sediment compositions. First is the high land lakes like Lakes Naga and Hotoke, their sediments show laminated biomat sediment over glacial silt. Second is the glacial lakes like Lakes West Hamuna and Tubaki, their sediments show laminated silt and sand layer on glacial gravel deposit. Third is the lowland lakes like Lake Oyako. Glacial silt, high organic marine deposit, sand with biota-density layers, lagoonal high organic layer, and lake biomat deposited in turn from the bottom to top. Fourth is the shallow marine area like the Gulf Osen, mud is continuously deposited on the bottom sandy gravel layer. In this presentation, an interim result about these core lithologies and sediment compositions will be introduced.

References

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